WORK-RELATED MUSCULOSKELETAL DISORDERS (WMSD)

Work-related musculoskeletal disorders (WMSD)-

- Result from the cumulative effect of repeated traumas associated with specific workplace risk factors.
- Can result in a variety of injuries or illnesses of the muscles, tendons, ligaments, nerves, joints, cartilage, bones, and supporting blood vessels in either the upper or lower extremities or the back.
- Can cause, over a period of time, permanent damage to muscles, tendons, and tendon sheaths, and related bones, muscles, and nerves.
- Can result in permanent disability.

WMSDs are a significant problem for the services because they result in duty or work limitations, decreased readiness, and increased workers' compensation costs. Therefore, preventing WMSDs not only protects the work force, but it also makes good business sense. Injured service members or employees force units to deal with decreased output, replacement costs, retraining, increased errors, and an increased demand on the rest of the work force. Facilities that have implemented successful ergonomics programs have seen measurable results in terms of protecting the work force, increasing productivity and quality, decreasing workers' compensation expenditures, increasing readiness, and reducing absenteeism and employee turnover.

MSDs are not just related to work and workplace conditions. A number of activities (e.g., golf and tennis) that require repeated movements concentrated in specific body parts that may lead to injury or illness. Some common MSDs include:

- **Tendonitis**. An irritation (inflammation) of a tendon resulting from repeated force or stress on that muscle/tendon group.
- **Lateral epicondylitis (tennis elbow).** An irritation (inflammation) of the tendons attached on the outside of the elbow caused by activities that have jerky throwing motions or impact (e.g., turning a screwdriver).
- **Medial epicondylitis (golfer's elbow).** An irritation (inflammation) of the tendon attachments on the inside of the elbow resulting from activities that require repeated or forceful rotation of the forearm and bending of the wrist at the same time.
- **Tenosynovitis.** An irritation (inflammation) of the tendon and the lining of the smooth sheath surrounding the tendon, resulting from repeated movement of the tendon in the sheath.
- **Synovitis.** An irritation (inflammation) of the inner lining of the membrane surrounding a joint or tendon.

- **Stenosing tenosynovitis of the finger (trigger finger).** This condition results from a tendon surface becoming irritated and rough. If the tendon sheath also becomes inflamed and presses on the tendon, a progressive constriction of the tendon can occur, resulting in a loss of free movement in that joint area. This disorder is commonly caused, for example, by repeated use of a staple gun or pair of pliers.

- **de Quervain's disease.** This "disease" is a stenosing tenosynovitis affecting the tendons on the radial side (e.g., thumb side) of the wrist. Constriction of these tendons pulls the thumb back away from the hand, causing severe pain and limited thumb movement or use.

- **Raynaud's phenomenon (white finger or vibration syndrome).** This "phenomenon" is caused by the reflexive constriction of the small arteries, which causes the fingers to become white (pale) and feel cold, numb, and tingly. This disorder may be caused, in part, by prolonged hand-arm vibration from powered hand tools.

- **Thoracic outlet syndrome.** This syndrome involves compression of the nerves and blood vessels between the neck and shoulder. Symptoms include numbness of the fingers and hand. Compression is due to various postures or activities, such as working with the arms above shoulder height and pulling the shoulders back and down.

Symptoms of MSD

The signs and symptoms of MSDs vary according to the type of injury or illness, but typically include:

- pain that does not cease overnight
- numbness and tingling
- decreased joint motion, mobility, and strength
- fatigue

Ergonomic Risk Factors

Workplace ergonomic risk factors that contribute to MSDs include:

- Posture – awkward posture that require increased muscle force and forces on the spine
- Repetition – highly repetitive tasks often prevent adequate tissue recovery from stresses
- Force – forceful exertions increase the physiologic stress on the muscles, tendons, and joints

- Mechanical compression or contact stress – pressure over a small area that interferes with blood flow and nerve functions.
- Duration – amount of time the worker is exposed to the stress.
- Vibration – localized stress when the body contacts a vibrating object
- Temperature – prolonged exposure to cold produces numbness, reduces manual dexterity, and decreases circulation that can reduce ability of tissue to recover form physiologic stress.

Independent reviews by the National Institute for Occupational Safety and Health and the National Research Council concluded that occupations that exposed employees to one or more of the above ergonomic risk factors report higher incidence of injury, illness, loss of work, and disability. Non-work factors such as age, gender, and exposure to non-workplace physical factors also contribute to WMSDs. Although specific interventions have been show to reduce WMSDs in high-risk tasks, no known single intervention is universally effective. Successful interventions consider the individual, organization, and job characteristics to tailor the corrective action.